NEW DISCOVERIES ABOUT YOUR TEETH

What to Eat, When to Eat and When Not to Eat, and Why Your Tooth-brush Increases Your Dentist Bills.

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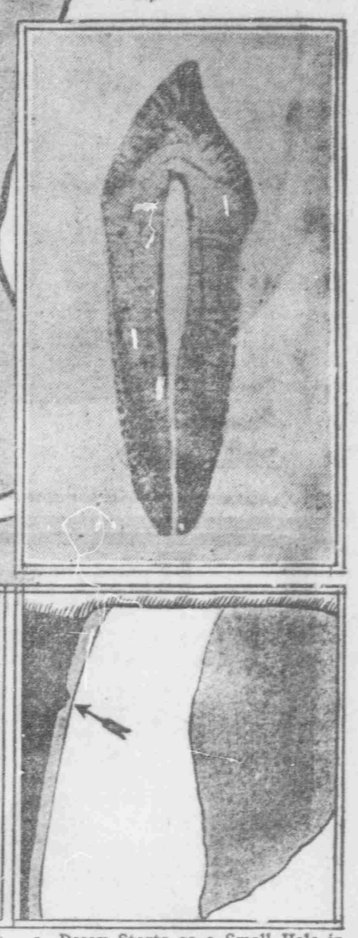
1—Teeth Just After a Meal, Showing Coat of Gummy Deposit and Bit of Food Lodged Between.

2—Result of Toothbrush Which Merely Cleans Front and Back Surfaces.

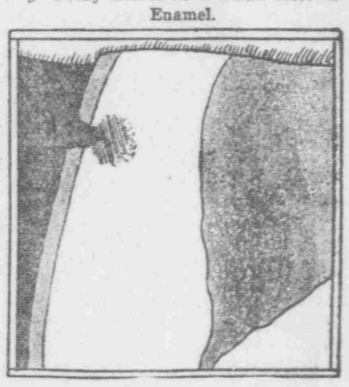
3—Eating an Apple Thoroughly Cleanses the Surfaces, but Leaves the Bit Between the Teeth.

4—Only Dental Floss Will Complete the Work and Lay Bare the Decay Started by the Bit of Food.



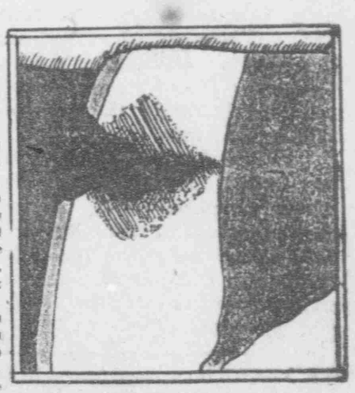
Cross Section of a Tooth Showing Enamel Covering the Dentine, and in the Centre, the Nerve or Pulp.

5—Decay Starts as a Small Hole in Enamel.



6—Which Penetrates to the Dentine—

7—And Forms a Pocketful of Germs—



8—That Rapidly Enlarge It Till the Pulp Becomes Inflamed, Causing Toothache—

9—When the Pulp Is Reached Ulcerated Tooth Results.

By J. SIM WALLACE, M. D., D. S.

EVERYBODY takes for granted the common belief that human teeth are weak, and decay through their own poor construction. Bald heads and bad teeth have long been looked upon as the result of our civilized degeneration.

The latest dental researches show that this is all wrong. Human teeth of today grow in our jaws just as strong and firm as ever, and a few simple changes of diet and a modicum of care are all that is needed for us to die with as many sound ones in our mouths as the cave dwellers carried to their graves.

All the world has been taught that a liberal use of the toothbrush is the best and only preventive of decay there is. The truth is that the toothbrush is a positive harm, because relying on this false protection, human beings have neglected to seek out other real preventives. The toothbrush being a failure as a guard against decay it becomes in this way really a maker of business for the dentist.

Is seems that the apple is nature's own tooth-brush. Not only do the crisp mouthfuls clean the teeth of the gummy film that starches and sugars leave on them to shelter, and feed millions of microbes, but they cleanse and partially sterilize the whole mouth, tonsils, and throat.

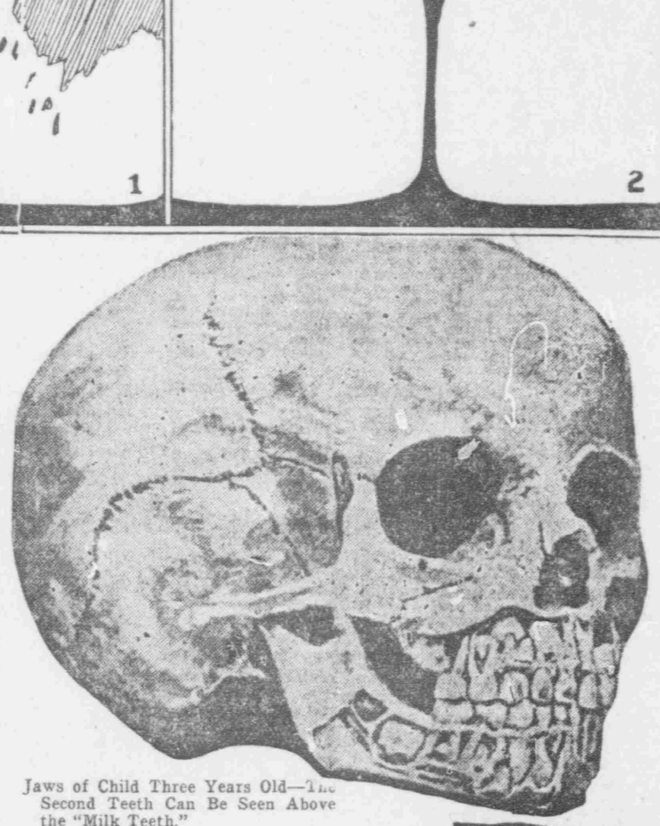
The artificial tooth-brush fails completely in this important task. All day and all night, the bristles collect dust and germs on a shelf or washstand. When used the brush scours thoroughly those surfaces of the front and back which are always clean under all circumstances.

Between the teeth and around the gums, where the microbes multiply and caries (decay) really begins, the toothbrush never goes. The toothpick does a certain amount of good by removing such big bits of food as call attention to their presence by pressure on the gums. Here dental floss or any sort of similar thread shows its great importance.

If carefully used the spaces between the teeth are freed of food and the edges of the teeth cleaned and polished. But even more important than mechanical cleaning of the teeth is a rational method of eating our meals, especially in childhood.

Before the true part played by the food stuffs was known it was, of course, impossible to prevent the disease; indeed, even to the present day all that is generally done is to advocate the toothbrush and antiseptics after every meal, and this has not been altogether satisfactory by any means. It had come to be accepted that any ordinary meal of necessity left the mouth dirty, and consequently that it had to be cleaned artificially; it was never supposed that meals which were physiologically correct actually cleaned the mouth.

It was recognized that to prevent people eating sugar and starches or limiting them to those which did not ferment rapidly was out of the question, and the idea that the food should be sufficiently hard to afford the teeth the exercise necessary for their vigorous development was not acted upon, probably because we were all aware that their development was completed before they cut the gums and in the case of the temporary teeth before the child had stopped sucking liquid milk. Now that we know the role of the food stuffs in the etiology of caries it is possible for us to show how the disease may be prevented, and, although it has been said that people would not adopt the method we advocate, it is a fact that already many people have adopted it, and where it has been commenced at a sufficiently early age the results have so far been absolutely perfect.



Jaws of Child Three Years Old—The Second Teeth Can Be Seen Above the "Milk Teeth."

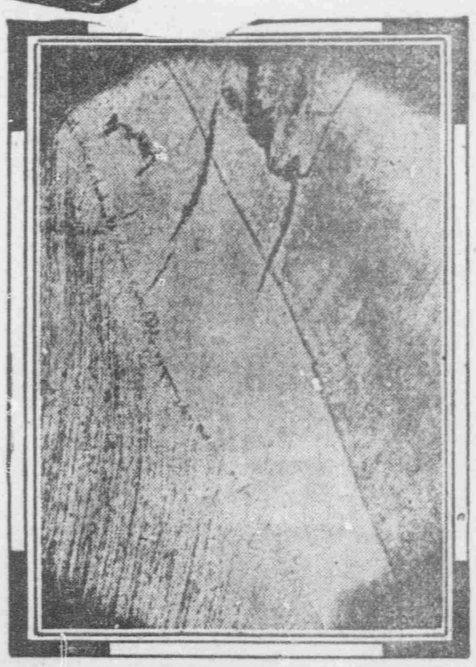
(From Marshall's "Operative Dentistry," J. B. Lippincott.)

Chemical evidence shows that sugars are even more harmful than starches, no doubt from the fact that in addition to inversion cane-sugar undergoes a fermentation, forming a gummy substance which not only clings about the teeth but also tends to catch other particles of food and to retain them in contact with the teeth also. Secondly, sugar hampers the action of the saliva, and lastly the method of eating sugar in the form of bonbons causes a continuous supply of this fermentable material to be available for the acid-forming bacteria lodging in the crevices of the teeth. Moreover, concentrated sugar such as one gets in sweets has an irritating effect on the mucous membrane, and it is probable that the mucus secreted under these conditions may rather favor the retention of food particles than otherwise. With regard to the relative excellence of the teeth among the natives in the sugar-cane plantations, this is, of course, largely due to the fact that the fibrous cellulose of the cane stimulates the self-cleansing factors most thoroughly.

Inasmuch as bread, which is the chief source of proteid among the poor, contains an excess of carbohydrates, the spending of money by this class on sugar is practically sheer waste from the point of view of physiology. This point should always be considered by those who belaud sugar on account of its cheapness.

For the first six or nine months of a child's life it has been accustomed to extracting liquid from the mother's breast, and through all the ages of man's evolution nothing was mixed with this milk. When, with increasing age and concomitant changes, the first article of food was presented to the child it was given at a different time from the sucking of the milk. I think it must be obvious that in a state of nature it was utterly impossible to soak food in milk in order to effect the transition from mother's milk to the ordinary foods of children and adults. Moreover, there is no precedent which could in any way be interpreted as justifying the method of transition from milk to solid food which has been so universally adopted.

I shall exemplify how the transition from milk to solid food is usually carried out by a few extracts from a recent authoritative textbook published "to aid the young practitioner" of medicine. So far as he is concerned, the author, it will be granted, is strictly orthodox. After nine months, he says, "dilution of the milk is not necessary * * * Some solid food may be added in the shape of boiled bread or porridge, or pudding. These additions must be small in quantity at first." Then when the child is twelve months old, he says: "The porridge may be made thicker and of coarser oatmeal. A little potato and gravy or half an egg may be given once a day. Soft bread and butter or dripping may be taken." Now what happens when an infant, hitherto accustomed to milk, is given bread well-soaked in milk? The first noticeable effect is that the infant gulps down the milk-soaked bread and milk without any attempt at retaining it in the mouth or mixing it with saliva. The starchy matter in the bread is therefore washed into the stomach without any insalivation, without any conversion of the starch, and without any preparation for digestion in the stomach.



Decay Starting at Crack in Enamel Caused by Hot Food, Followed by Cold Water.

The physiological effect which the mouth till it has become liquefied and prepared for deglutition.

At a later stage, say about the thirteenth month, when the first temporary molars have taken their positions, what happens when the child is restricted to this soft diet? The previous troubles continue and the teeth get dirty and tender from want of use; later they become carious and the tenderness increases, while for the same reasons mastication is not performed, and so these troubles and others resulting therefrom become more or less thoroughly established. The child is pronounced constitutionally or hereditarily delicate, and a whole list of troubles are attributed to teething which in reality are the outcome of digestive derangement resulting from an erroneous system of dietary.

The next point to which I would refer is the necessity to have the meal arranged. It is not a matter of indifference whether we eat in the orthodox arrangement or in the reverse order; there are good physiological reasons for the arrangement of the meal as custom so generally prescribes. I do not intend, however, to go into this in detail. I only wish to mention that in a well organized repast dessert always follows sweets. This is done not because physiologists have told us it is right, but I think it is because sweets leave a sticky or clammy feeling about the mouth, while fresh fruit leaves a clean and refreshing flavor. Over and above this, fresh fruit not only makes the mouth feel clean; it actually does clean the mouth, as will be seen by referring to the essential requirements of oral hygiene.

We must bear in mind these two points: The necessity for food which demands efficient mastication, and, secondly, the necessity for finishing the meal in such a way that the mouth will be left physiologically clean. Then consider actual dietaries, such as are usually found at the present day, and we find that they frequently violate one or more of the physiological requirements we have referred to. For example, the following is quite a common breakfast: porridge and milk, an egg; bread and marmalade, and milk, tea, or coffee. On the whole, this meal is too soft, and on that account, would rather discourage efficient mastication, and stimulate simply swallowing the food. On this account the detergent effect which should accompany mastication is lost and the food is not properly insalivated or prepared for passage into the stomach. Moreover, it may be presumed also that the stomach is not properly prepared for the reception of food, for the mastication of food has an effect on the secretion of the gastric juices. Secondly, the meal being finished with bread and marmalade, the action of the saliva is hampered by the presence of concentrated sugar, and the sticky or lodgable nature of the food tends to establish all the requisite conditions for the destruction of the teeth.

It may be asked what should be recommended rather than the breakfast which we have criticised. Well, a typical, somewhat similar and yet satisfactory breakfast would be: Bacon or bacon and egg, baked or toasted bread, fresh fruit; also a slice of a melon or an apple, followed by tea or coffee. This might by some be regarded as too much. It is quite easy to reduce it by omitting the bacon or egg, or both. And if for any reason the fresh fruit is not desired it may possibly be omitted also without harm resulting, provided the tea or coffee is taken after the meal.

With regard to the next meal, the luncheon or dinner, I need not say much. The errors are similar to those already referred to in the breakfast, but generally not so pronounced, as it usually includes a piece of meat of some kind, and this, as a rule, stimulates at least a little mastication. Moreover, I have heard that it is becoming fashionable to provide toast or baked bread at this meal, and although this probably originates from the fact that people may always be presumed to be suffering more or less from indigestion, still, from whatever motives, we may welcome the change. The midday meal, however, generally terminates with sweet puddings of some kind or another, and although they may not be so bad as bread and marmalade or jam for leaving the mouth dirty, they certainly are not cleansing, and ought therefore to be followed by fresh fruit. With regard to what children should be given to drink with, or rather after, this meal, I am strongly of opinion that it should be water and not milk.

With regard to the last meal of the day. It generally resembles either the breakfast or the lunch, and we need not say much about it. Sometimes it is, however, what we might call a purely vegetarian meal, consisting chiefly of milk or tea, bread and butter, jam, scones and cake. Now a meal such as this is particularly objectionable, as you will observe from what we have already said, but being the last meal of the day the harmfulness is augmented by the fact that the mouth has not the chance of being thoroughly cleansed from the remains of such a meal till the next morning.

It has been observed by many dentists that the teeth of vegetarians appear to be subject to rapid decay, and this has been my experience. It is not always so, and it is by no means necessarily so, for a vegetarian meal can be arranged physiologically just as a mixed meal can. If the meal is composed of baked bread, or toast and cheese, or ship's biscuit and butter, followed by an apple, there will be no reason to expect the slightest harm to result to the teeth.

So far, we have assumed that the teeth are free from caries, but it very frequently happens before prevention is thought of. When caries is not far advanced in the temporary teeth all that is required to be done is to have the carious teeth filled and at the same time initiate the necessary changes in diet which will in future prevent further decay in the teeth. To fill teeth and not to correct the error which brought on the caries amounts to little more than to invite the patient to return for similar operations in six months or a year.

It should be distinctly realized that dental caries is a very distinct sign of persistent dietetic error, and it is the duty of the medical practitioner to correct this error in any child in which he finds dental caries. It should be borne in mind that the filling of teeth does not increase the autopurification of the buccal cavity, at least outside the radius of the filling itself—that, indeed, the mouth may be kept continually in a dirty and dangerous state, although the teeth are filled regularly every three months.

Fortunately, the habit of chewing gum has taken hold upon all classes of people, especially the young. The muscles of the jaw, missing the exercise for which they were meant and which modern foods do not bring, are relieved by the gum chewing.

But better than this is the friction of the gum itself against the surfaces of the teeth, which cleanses them and promotes the flow of saliva about the intestines, removing germ colonies, which would otherwise be left to work decay.

If the tooth is in a neglected mouth the germ finds plenty of nutriment in the form of a gummy covering from sugars deposited near the gum or beneath a bit of food which has become wedged between the teeth. With the rapid multiplication of the bacteria lactic acid is given off, which dissolves the face of the tooth's enamel.

The touch of a brush or a bit of fruit at this time would wipe the colony out of existence and end the trouble at this point. But soon the acid eats a pocket into the enamel. This becomes filled with germs which are so protected that they can only be dislodged with considerable friction.

When the enamel has been eaten through the germs enter the dentine, where progress is more rapid. Week after week the cavity grows, though, perhaps, there is only a pin point of a hole on the outside to mark the entering point. At last the vanguard of the microbian army reaches so near the pulp, or nerve, of the tooth that the pulp becomes inflamed.

The next step is the penetration of the thin remaining barrier to the pulp. Inflammation of the pulp we call toothache, but when the pulp has actually been reached, the ensuing formation of pus causes all the agonies of the ulcerated tooth. At this stage even the most negligent person decides to have something done about it, usually to have it out.